No. 9300260

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Farmers Marketing Corporation

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

DURUM WHEAT

'Diavolo Duro'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D.C. *this* 28th *day of* February *in the year of our Lord one thousand nine hundred and* ninety-five.

Attest:

Kenneth B. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Rich Rominger
Secretary of Agriculture

FORM APPROVED: OMB 0581-0055, Expires 1/31/91

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1 NAME OF APPLICANT(S) *(as it is to appear on the Certificate)*
Farmers Marketing Corporation

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO.
D6682

3. VARIETY NAME
Diavolo Duro

4 ADDRESS *(street and no. or R.F.D. no., city, state, and ZIP)*
3501 E.Broadway Road
Phoenix, AZ 85040

5. PHONE *(Include area code)*
602/437-4058

FOR OFFICIAL USE ONLY

PVPO NUMBER
9300260

FILING Date: July 8, 1993
Time: ☐ A.M. ☐ P.M.

FEES RECEIVED
Filing and Examination Fee: $2325.00
Date: July 7, 1993
Certificate Fee: $275.00
Date: Feb. 10, 1995

6 GENUS AND SPECIES NAME
Triticum Turgidum L. Variety Durum

7. FAMILY NAME *(Botanical)*
Gramineae

8 CROP KIND NAME *(Common Name)*
Wheat - Durum

9 DATE OF DETERMINATION
June 1993

10 IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*
Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
AZ

12. DATE OF INCORPORATION
1952

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
Rex K. Thompson, Plant Breeder
Farmers Marketing Corporation
3501 E.Broadway Rd.
Phoenix, AZ 85040

PHONE *(Include area code)*: 602/437-4058

14 CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow INSTRUCTIONS on reverse)*

- a. [X] Exhibit A, Origin and Breeding History of the Variety
- b. [X] Exhibit B, Novelty Statement.
- c. [X] Exhibit C, Objective Description of Variety.
- d. [ ] Exhibit D, Additional Description of Variety.
- e. [X] Exhibit E, Statement of the Basis of Applicant's Ownership
- f. [X] Seed Sample (2,500 viable untreated seeds) Date Seed Sample mailed to Plant Variety Protection Office July 1, 1993
- g. [X] Filing and Examination Fee ($2,150) made payable to "Treasurer of the United States."

15 DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See section 83(a) of the Plant Variety Protection Act.)*
[X] YES *(If "YES," answer items 16 and 17 below)* ☐ NO *(If "NO," skip to item 18 below)*

16 DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
[X] YES ☐ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
[X] FOUNDATION [X] REGISTERED [X] CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ YES *(If "YES," through* ☐ Plant Variety Protection Act ☐ Patent Act. Give date. _____ .)
[X] NO

19 HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?
[X] YES (If "YES," give names of countries and dates) Greece - Greek Registry March 1993
☐ NO

20 The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT *(Owner(s))*	CAPACITY OR TITLE	DATE
Sheldon E. Richardson	President, C.E.O.	6/30/93
Sheldon E. Richardson	President, CEO	6-30-93

FORM CSSD-470 (5-89) Edition of FORM LS-470, 3-86, is obsolete

EXHIBIT A

ORIGIN AND BREEDING HISTORY OF DIAVOLO DURO

'Diavolo Duro' (D6682) spring durum wheat was derived by Farmers Marketing Corporation from a single F_2 head selection from a genetic male sterile facilitated recurrent selection population. The original population was developed by The University of Arizona and released as AZ-MSFRS-86 Quality Enhanced Spring Durum Wheat Germplasm. Seed from a single F_3 plant was harvested in Post Falls, Idaho in Fall of 1987, and increased in Arizona in Spring of 1988. In the Fall of 1988, 11 F_5 headrows were harvested in Post Falls. F_6 seed was increased in Maricopa in 1989. Fifty F_7 headrows were grown at Yuma, Arizona in 1990. Forty were considered uniform, harvested in bulk and increased at Yuma in 1991 to form the basis of present breeder seed. A one acre field was grown for foundation seed in 1993.

Diavolo Duro is uniform and stable. An occasional brown plant (.01%) was rogued from the foundation seed increase. A few plants with later heading (.01%) attributed to delayed emergence because of compaction and wet soil conditions were also rogued. Less than .01% brown plants and .01% later maturing plants may be expected in the seed increase. No genetic male sterile were observed, however, because of seed set on unidentified male sterile there may be an occasional male steriles plant (.001%). Headrows are to be grown in 1994 to further eliminate any off-types or possible male sterile occurrence.

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FMC addendum to PVP Application No. 93002560 'Diavolo Duro'
Date: 12/22/93

1. Exhibit A

# of generations stability observed: 5 years, 1989 - 1993. Maricopa, AZ

2. Exhibit A

Breeding Criteria: Increased semolina quality (protein, color, gluten strength), lodging resistance, and yield under irrigated production.

<u>Germplasm Source Explanation</u>

The durum cultivar, D6682 'Diavolo Duro' was selected and developed from a broad-base, diverse population, AZ-MSFRS-86 Quality Enhanced Semidwarf Durum Wheat Germplasm. The durum population was developed over a period of four years and eight generations by genetic male sterile facilitated recurrent selection population breeding from a broad diversified CIMMYT, Northern U.S., Canadian, and Walian durums and descendants of their hybridization. These were assembled in eight years of a conventional pedigree and population breeding program. Large numbers (500-1000) of controlled sib and top-crosses (50%) were selected for yield and quality characteristics. Among cultivars most frequently used in repeated top crossing for quality were 'Vic', 'Wakooma', 'Wascoma', 'Cando', 'Edmore', 'Leeds', 'Lloyd', and 'Westbred 881'. To complete each cycle the bulk F seed was increased in Montana each year.

3. Exhibit C

Date of Determination: 1989

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EXHIBIT B

NOVELTY STATEMENT

Diavolo Dura is most like Mexicali 75 except for the following differences:

1) Glumes of Diavolo Duro are very pubescent (hairy) while glumes of Mexicali 75 are glabrous.

2) Spikes are of similar size, compact and tapered similar to Mexicali 75. However, the face width of Diavolo Duro is 4 mm less than the width of the two row profile (flat side). Mexicali 75 is similar for both face and side.

3) Brush of Mexicali 75 is collared, and brush of Diavolo Duro is not collared.

4) Spikes of Mexicali 75 are white with white awns. Spikes of Diavolo Duro are white with darker awns.

5) Diavolo Duro significantly reaches physiological maturity later than Mexicali 75 by approximately eight days.

6) Diavolo Duro generally has significantly higher wheat, and semolina protein as well as other quality characteristics than Mexicali 75 (Tables 7 - 10).

FORM APPROVED: OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
COMMODITIES SCIENTIFIC SUPPORT DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*TRITICUM SPP.*)

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S)
Farmers Marketing Corporation

ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*)
3501 E. Broadway Road
Phoenix, AZ 85040

FOR OFFICIAL USE ONLY

PVPO NUMBER

VARIETY NAME OR TEMPORARY DESIGNATION
Diavolo Duro (D6682)

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. KIND:
[2] 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:
[1] 1 = SPRING 2 = WINTER 3 = OTHER (*Specify*) _____
[3] 1 = SOFT 2 = HARD 3 = OTHER (*Specify*) Vitreous

[3] 1 = WHITE 2 = RED 3 = OTHER (*Specify*) Amber

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:
[1][1][3] FIRST FLOWERING
[1][2][0] LAST FLOWERING

4. MATURITY (*50% Flowering*):
[ ][ ] NO. OF DAYS *EARLIER* THAN .....
[ ] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS
[ ][5] NO. OF DAYS *LATER* THAN .....
[7] 7=Mexicali 75

5. PLANT HEIGHT (*From soil level to top of head*):
[ ][9][7] CM. HIGH

[1][1] CM. TALLER THAN .....
[8] 7=Mexicali 75 8=Aldura
[ ][3] CM. SHORTER THAN .....
[7] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING (*See reverse*):
[1] 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHER COLOR:
[1] 1 = YELLOW 2 = PURPLE

8. STEM:
[1] Anthocyanin: 1 = ABSENT 2 = PRESENT
[2] Waxy bloom: 1 = ABSENT 2 = PRESENT
[1] Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT
[1] Internodes: 1 = HOLLOW 2 = SOLID
[ ][4] NO. OF NODES (*Originating from node above ground*)
[1][7] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:
[1] Anthocyanin: 1 = ABSENT 2 = PRESENT
[1] Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:
[1] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER (*Specify*): _____
[1] Flag leaf: 1 = NOT TWISTED 2 = TWISTED
[ ] Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT
[2] Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT
[2][0] MM. LEAF WIDTH (*First leaf below flag leaf*)
[3][7] CM. LEAF LENGTH (*First leaf below flag leaf*):

FORM LMGS 470-6 (6-82) (Formerly Form LPGS 470-6 (3-79), which may be used)

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11. HEAD:

[2] Density: 1 = LAX 2 = DENSE

[1] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) _____

[1] Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

[ ] Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER (Specify): _____

[1][0] CM. LENGTH

[1][4] MM. WIDTH

12. GLUMES AT MATURITY:

[3] Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.) 3 = LONG (CA. 9 mm.)

[3] Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.) 3 = WIDE (CA. 4 mm.)

[5] Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE

[3] Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

[1] 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

[1] 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

[3] 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

[3] Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

[2] Cheek: 1 = ROUNDED 2 = ANGULAR

[1] Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

[1] Brush: 1 = NOT COLLARED 2 = COLLARED

[ ] Phenol reaction (See instructions): 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK

[2] Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____

[ ][8] MM. LENGTH

[ ][4] MM. WIDTH

[5][6] GM. PER 1000 SEEDS

17. SEED CREASE:

[3] Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

[1] Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] STEM RUST (Races) _____

[0] LEAF RUST (Races) _____

[0] STRIPE RUST (Races) _____

[0] LOOSE SMUT

[0] POWDERY MILDEW

[0] BUNT

[0] OTHER (Specify) _____

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] SAWFLY

[0] APHID (Bydv.)

[0] GREEN BUG

[0] CEREAL LEAF BEETLE

[0] OTHER (Specify) _____

HESSIAN FLY RACES: [0] GP [0] A [0] B [0] C [0] D [0] E [0] F [0] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Mexicali 75	Seed size	Mexicali 75
Leaf size	Duraking	Seed shape	Mexicali 75
Leaf color	Yavaros 79	Coleoptile elongation	Mexicali 75
Leaf carriage	Durex	Seedling pigmentation	Mexicali 75

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggle and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. (See attachment.)

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Table Descriptions

A. Table 1 is for the paried t-test analysis for the novelty statement and additional descriptions.

B. Tables 2-6 are for additional descriptions on agronomic data.

C. Tables 7 - 10 are for additional descriptions on quality data.

Table 1. Paired t - test analysis for differentiating Diavolo Duro from four commonly grown durum wheat varieties.

	Diavolo Duro			
	Test Wt. (lbs/bu)	Plant Ht. (in.)	50% heading	Physical Maturity
Mexicali 75	-.144	-.87	1.58	7.35**
Yavaros 79	-5.42**	1.00	-4.24**	-2.95
Reva	-1.75	5.75**	0.34	0.33
Aldura		4.61**		

** = significant t at $\alpha = 0.05$

Table 2. Production grain yield for Diavolo Duro, and Mexicalli in Arizona measured over eight location years. Grain yield reported in pounds per acre.

Location/year	Diavolo Duro	Mexicali 75	Yavaros 79	Reva
Sacaton, AZ 1988	6632.00	7663.00	8500.00	6814.00
Maricopa, AZ 1989	6606.00	6748.00	6684.00	6679.00
Maricopa, AZ 1990	5861.00	5211.00	6878.00	5942.00
Yuma, AZ 1990	6768.00	7390.00	6729.00	6534.00
Maricopa, AZ 1991	8618.00	6708.00	8504.00	7817.00
Yuma, AZ 1991	6743.00	6554.00	6779.00	6670.00
Maricopa, AZ 1992	6331.00	6506.00	7163.00	6464.00
Yuma AZ, 1992	7042.00	7205.00	7528.00	8049.00
Mean	6825.00	6748.00	7345.00	6872.00
σ_{n-1}	804.51	748.18	765.20	707.65
σ_{error}	284.40	264.52	270.00	250.19

Table 3. Grain test weight measured over six location years. Test weight in pounds per bushel.

Location/year	Diavolo Duro	Mexicali 75	Yavaros 79	Reva
Sacaton, AZ 1988	63.00	64.00	66.00	64.50
Maricopa, AZ 1989	65.00	64.00	66.50	64.00
Maricopa, AZ 1990	60.00	63.00	65.00	63.60
Maricopa, AZ 1991	63.00	65.50	66.50	65.50
Maricopa, AZ 1992	62.00	62.00	63.50	61.00
Yuma, AZ 1992	62.00	62.00	66.00	65.00
Mean	62.50	63.40	65.50	63.80
σ_{n-1}	1.64	1.38	1.16	1.59
σ_{error}	0.67	0.55	0.47	0.65

Table 4. Plant height measured over four location years.

Location/year	Diavolo Duro	Mexicali 75	Yavaros 79	Reva	Aldura
Maricopa, AZ 1989	38.00	37.00	37.00	35.00	35.00
Maricopa, AZ 1990	34.00	37.00	34.00	32.00	31.00
Maricopa, AZ 1991	41.00	42.00	41.00	37.00	35.00
Maricopa, AZ 1992	41.00	41.00	41.00	39.00	34.00
Mean	38.00	39.30	38.30	35.80	33.80
σ_{n-1}	3.32	2.63	3.40	2.99	0.89
σ_{error}	1.66	1.32	1.70	1.49	0.95

Table 5. Grain standability measured over five location years. Reported as lodging at maturity.

Location/year	Diavolo Duro	Mexicali 75	Yavaros 79	Reva
Sacaton, AZ 1988	0.00	0.00	0.00	0.00
Maricopa, AZ 1989	5.00	20.00	10.00	0.00
Maricopa, AZ 1990	69.00	68.00	65.00	51.00
Maricopa, AZ 1991	0.00	70.00	0.00	0.00
Maricopa, AZ 1992	85.00	90.00	80.00	45.00
Mean	31.80	45.60	31.00	19.20
σ_{n-1}	41.70	37.83	38.47	26.38
σ_{error}	18.65	16.92	17.21	11.80

Table 6. Grain Maturity measured over five location years. Reported in number of days from January 1 to 50% heading.

	Diavolo Duro		Mexicali 75		Yavaros 79		Reva	
Lab.Location/year	50% Head	Maturity	50% Head	Maturity	50% Head	Maturity	50% Head	Maturity
Sacaton , AZ 1988	88.00	132.00	81.00	127.00	87.00	137.00	85.00	135.00
Maricopa, AZ 1989	88.00	133.00	79.00	124.00	81.00	129.00	78.00	123.00
Maricopa, AZ 1990	94.00	149.00	87.00	144.00	93.00	130.00	87.00	144.00
Maricopa, AZ 1991	90.00	140.00	82.00	139.00	87.00	146.00	84.00	141.00
Maricopa, AZ 1992	84.00	*	78.00	*	80.00	*	79.00	*
Mean	87.00	139.00	81.00	131.00	86.00	140.00	83.00	133.00
σ_{n-1}	3.63	7.85	3.51	9.54	5.27	9.24	3.91	9.29
σ_{error}	1.63	3.93	1.57	4.77	2.36	6.93	1.75	4.64

Table 7. California Regional durum wheat quality means for the year 1991among five durum varieties. Testing was done by the USDA, North Dakota State Quality Testing Lab.

Variety	1000 KWT†	ASH††	Wheat Protein†††	Hardness§	Fall No.§§	Total Extract§§§	Semolina Extract‡
Bravadur	59.80	1.80	14.23	119.00	431.30	79.70	63.90
Durostar	48.70	1.80	12.53	112.70	424.30	75.80	61.40
Amber	51.30	1.60	11.90	126.70	400.00	76.80	62.30
Bronco	53.50	1.70	13.10	122.30	456.70	80.10	63.40
Mexicali	57.60	1.70	12.40	123.70	449.30	78.70	63.00
LSD P=0.05	6.70	0.10	0.80	9.70	60.40	4.90	3.10

†1000 Kernel weight in grams.
††Ash content.
†††Wheat Protein on 14% moisture basis.
§Kernel hardness.
§§Fall No. = Semolina Falling Number.
§§§Total extraction percentage.
‡Semolina extraction percentage.

Table 8. California Regional durum wheat quality means continued for the year 1991 among five varieties. Data was derived by the USDA, North Dakota State Quality Testing Lab.

Variety	SPK†	DUS††	MIX†††	Semolina Protein§	VI§§	Cook Wt.§§§	FIRM‡
Bravadur	58.70	85.00	3.33	13.00	8.50	31.80	5.80
Durostar	40.00	81.70	2.00	11.10	8.50	32.70	5.50
Amber	65.70	95.00	2.00	11.40	9.50	33.00	4.70
Bronco	62.00	85.00	1.70	11.70	8.70	32.70	5.40
Mexicali	48.60	85.00	3.00	11.30	7.80	32.80	5.30
LSD p=0.05	34.00	8.20	0.90	0.80	0.50	1.60	0.80

†Semolina speck count.
††Semolina dust color.
†††Mixograph score.
§Semolina protein percentage.
§§Spaghetti visual color score.
§§§Cooking weight in grams.
‡Cooked spaghetti firmness score.

FMC Small Grains Report 93-1.

Table 9. Mean quality data among 11 durum wheat varieties. Data was derived by the USDA, North Dakota State Quality Testing Lab. Means indicate sample results combined over four location years.

Variety	Sedimentation	Wheat Protein	Hardness	Semolina Extract	Semolina Color	Semolina Protein
Reva	41	14.2	116	63.3	95	13.5
Mexicali	31	12.0	113	65.1	80	10.7
Durostar	32	12.9	114	65.1	80	12.4
Amber	17	12.6	117	64.8	95	11.5
Bravadur	35	14.1	116	65.5	88	13.7
Durex	44	13.1	117	66.5	93	12.4
Yavaros	22	12.3	122	61.1	60	10.4
Westbred 881	33	12.4	120	64.5	90	11.6
Diavolo Duro	35	11.7	118	59.3	80	10.3
Bronco	21	11.6	120	61.1	80	10.0
Mean	31.1	12.7	117.3	63.9	84.1	11.7
σ_{n-1}	8.7	.91	2.8	2.5	10.6	1.3

Table 10. Polyacrylamide Gel Eletrophoresis banding results[†] for glutenin subunits among eight durum wheat varieties tested by the University of California , Department of Agronomy and Range Science.

Variety	Glutenin Subunits						SDS SED[§§]
	OMEGA[§]	LMW[††]	GAMMA[§]	BETA[§]	ALPHA[§]	HMWB1[†††]	
DUREX	1	2	1	2	3	6 + 8	67
BRAVADUR	1	2	1	2	1	6 + 8	51
DUROSTAR	1	2	1	1	3	6 + 8	55
DIAVOLO DURO	1	2	1	1	3	7 + 8	55
BRONCO	1	1	1	2	1	6 + 8	31
AMBER	1	1	1	1	1	6 + 8	21
REVA	1	2	1	1	1	6 + 8	67
YAVAROS	1	1	1	2	1	20	28

[†]Significant interactions between LMW and HMWB1 revealed that in presence of LMW 2, lines with bands 6 + 8 had higher sedimentation values than those with bands 7 + 8. In the presence of LMW 1, the order is reversed. Therefore, a genotype with LMW 2 and HMWB1 6 + 8 is of higher gluten strength. Presence of alpha 3 , especially with beta 2 promote quality.
[††]LMW = Low molecular weight glutenin subunits.
[†††]HMBW1 = High molecular weight glutenin subunits
[§]Omega, Gamma, Beta, and Alpha glutenin variants.
[§§]SDS Sedimentation.

EXHIBIT D

ADDITIONAL DESCRIPTION

Diavolo Duro is late maturing spring durum resembling Mexicali 75 and Yavaros 79 in plant height, lodging, and straw strength. Yield is similar to that of Mexicali 75 and Reva and somewhat less than for Yavaros 79, a variety of lower semolina quality. Semolina quality of Diavolo Duro for pasta making is similar to Mexicali 75 with regard to protein, and semolina color. However, gluten strength,m semolina protein and vitreosness for Diavolo Duro is superior.

Diavolo Duro is significantly later to the 50% heading stage and has significantly lower test weight than Yavaros 79.

Diavolo Duro is significantly taller than both Reva and Aldura by approximately three and five inches, respectively.

Juvenile plant growth is erect. Plants at boot stage tend to be a yellow green. Spikes are tapered and flat sided, dense and white ambered with grey awns. Glumes are amber, very pubescent, wide and long with apiculate shoulders and acuminate beaks four mm long. Seeds are large, elliptical, vitrous and amber. The brush is short and not collared.

Ploy acrylamide gel electrophoresis banding results for glutenin subunits intidate that Diavolo Duro is different from Durex, Reva, and Yavaros 79.

EXHIBIT E

STATEMENT OF THE BASIS OF THE APPLICANTS OWNERSHIP

Regular employees of the applicant, Farmers Marketing Corporation, have developed Diavolo Dura.

Farmers Marketing Corporation is the proprietary owner and intended commercial user of the variety.